INTERNATIONAL
TSUNAMI
INFORMATION
CENTER

NEWSLETTER

P.O. Box 3830, Honolulu, Hawaii 96812

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
COMMISSION OCEANOGRAPHIQUE INTERGOUVERNEMENTALE
COMISION OCEANOGRAFICA INTERGUBERNAMENTAL
МЕЖПРАВИТЕЛЬСТВЕННАЯ ОКЕАНОГРАФИЧЕСКАЯ КОМИССИЯ

VOLUME X, NUMBER 4
DECEMBER 1977

The ITIC Newsletter bring news and information to tsunami researchers, engineers, educators, community protection agencies and governments in 45 countries. We welcome your news, reports, papers, or abstracts.

Mandate and Functions of the International Tsunami Information Center (ITIC)

By IOC Executive Council resolution EC-VII.13 following recommendation ITSU-V.1, made by the fifth session of the International Coordination Group for the Pacific Tsunami Warning System in the Pacific (ITSU), 23-27 February 1976, in Lima Peru, the Director ITIC was requested to prepare, in consultation with the Chairman of ITSU and the Secretary IOC, a new mandate for the ITIC.

Resolution X-23 of IOC was submitted to the tenth session of the IOC General Assembly, 27 October - 10 November 1977, Paris France, and adopted. Resolution X-23, as adopted, is reproduced here with the permission of the Secretary IOC.

RESOLUTION X-23

MANDATE AND FUNCTIONS OF THE INTERNATIONAL TSUNAMI INFORMATION CENTER (ITIC)

The Intergovernmental Oceanographic Commission,

Recalling recommendation ITSU-V.1 which called for the development of a clear mandate for the ITIC, in particular its functions, and the endorsement thereof by the Executive Council in resolution EC-VII.13,

Expresses its thanks to the Director, ITIC, for preparing a new mandate and list of functions for the Center;

Approves the revised Mandate and Functions for the International Tsunami Information Center (ITIC), Honolulu, attached hereto as an annex; and

Instructs the Secretary to disseminate this information widely to Member States of the International Co-ordination Group for the Tsunami Warning System in the Pacific (ITSU).

Annex to resolution X-23

Mandate and Functions of the International Tsunami Information Center (ITIC)
(Revised November 1977)

A. *MANDATE*

The mission of the International Tsunami Information Center (ITIC) is to mitigate the effect of tsunamis throughout the Pacific:

1. *by monitoring the international tsunami warning activities in the Pacific and recommending improvements with regard to communications, data networks, data acquisition, and information dissemination;*

2. *by bringing to Member and Non-member States knowledge on tsunami warning systems, on the affairs of ITIC and on how to become active participants in the activities of the ICG for the Tsunami Warning System in the Pacific (ITSU);*

3. *by assisting Member States of ITSU in the establishment of national warning systems and improving preparedness for tsunamis for all nations throughout the Pacific Ocean;*

4. *by gathering and promulgating knowledge on tsunamis and fostering tsunami research and its application so as to prevent loss of life and damage to property;*

5. *by co-operating with the World Data Centres in making available and providing through appropriate channels all records pertaining to tsunamis;*

6. *by assisting national authorities in making investigations of all aspects of major tsunamis and developing standard survey procedures for such investigations.*

B. *FUNCTIONS*

The International Tsunami Information Center shall:

1. (a) *Monitor the performance and effectiveness of the international tsunami warning activities and seek the co-operation of all participating Member States in improving these activities, where needed;*

   (b) *Develop and maintain communication with gauging authorities and agencies throughout the Pacific, and maintain an information file on tidal installations in order to facilitate the assessment of data received or required in developing appropriate models for both applied and pure research in the field of tsunamis.*

2. (a) *Arrange for the availability of technical information on the equipment required for an effective tsunami warning system. Co-operate with experts and seek the advice of specialists to ensure that knowledge of new technology applicable to the warning system is made available to all participants;*

   (b) *Publish a newsletter on a regular basis.*

3. (a) *Arrange, on request, for the provision of advisory and consultative services to Member States wishing to develop or improve their warning system capability. Provide liaison between Member States in the planning and development of regional warning systems;*

(b) *Provide advice and support in soliciting international funds for the development of warning system capability;*

(c) *Arrange for or conduct, on request, assessment of existing facilities and the promotion of improvements, in such areas as instrument standardization, automation, and real-time communications.*

4. (a) *Encourage and arrange for facilities for a visiting scientist programme within the IOC tsunami programme, and promote the exchange of scientists among countries;*

(b) *Initiate, co-ordinate, or conduct technical training programmes, workshops, and seminars, dealing with all aspects of tsunami preparedness;*

(c) *Initiate and foster the preparation, publication and dissemination of educational materials relative to tsunamis;*

(d) *Co-operate with national and international scientific and professional organizations in the encouragement and application of tsunami research, and in the standardization of tsunami data collection;*

(e) *Disseminate annual reports of tsunami research in progress by Member States and others;*

(f) *Support and participate in the publication of tsunami information, including such publications as regional tsunami catalogues and summaries of tsunamis;*

(g) *Identify research needed for the Tsunami Warning System in the Pacific.*

5. (a) *For each tsunami, assist the World Data Centres (tsunami) in soliciting and collecting as complete a set as possible of seismic and water level records showing the event, together with supplementary data and descriptive information of the event;*

(b) *Ensure that the requirements of ITSU for archiving and retrieving data are made known to the World Data Centres (tsunami);*

(c) *Maintain a data file and library on tsunamis sufficient to meet ITIC requirements and responsibilities, utilizing the World Data Centres (tsunami) as a primary source of these data;*

(d) *Arrange for the preparation and dissemination of a summary report for each tsunami.*

6. *Encourage, facilitate, and when invited participate, in the field investigation of tsunamis of large magnitude.*

NEWS EVENTS

The PEACESAT Project

The PEACESAT Project (Pan Pacific Education and Communication Experiments by Satellite) is an international educational experiment involving institutions in fourteen nations and territories of the Pacific Basin. All are linked by communication satellite for information sharing.

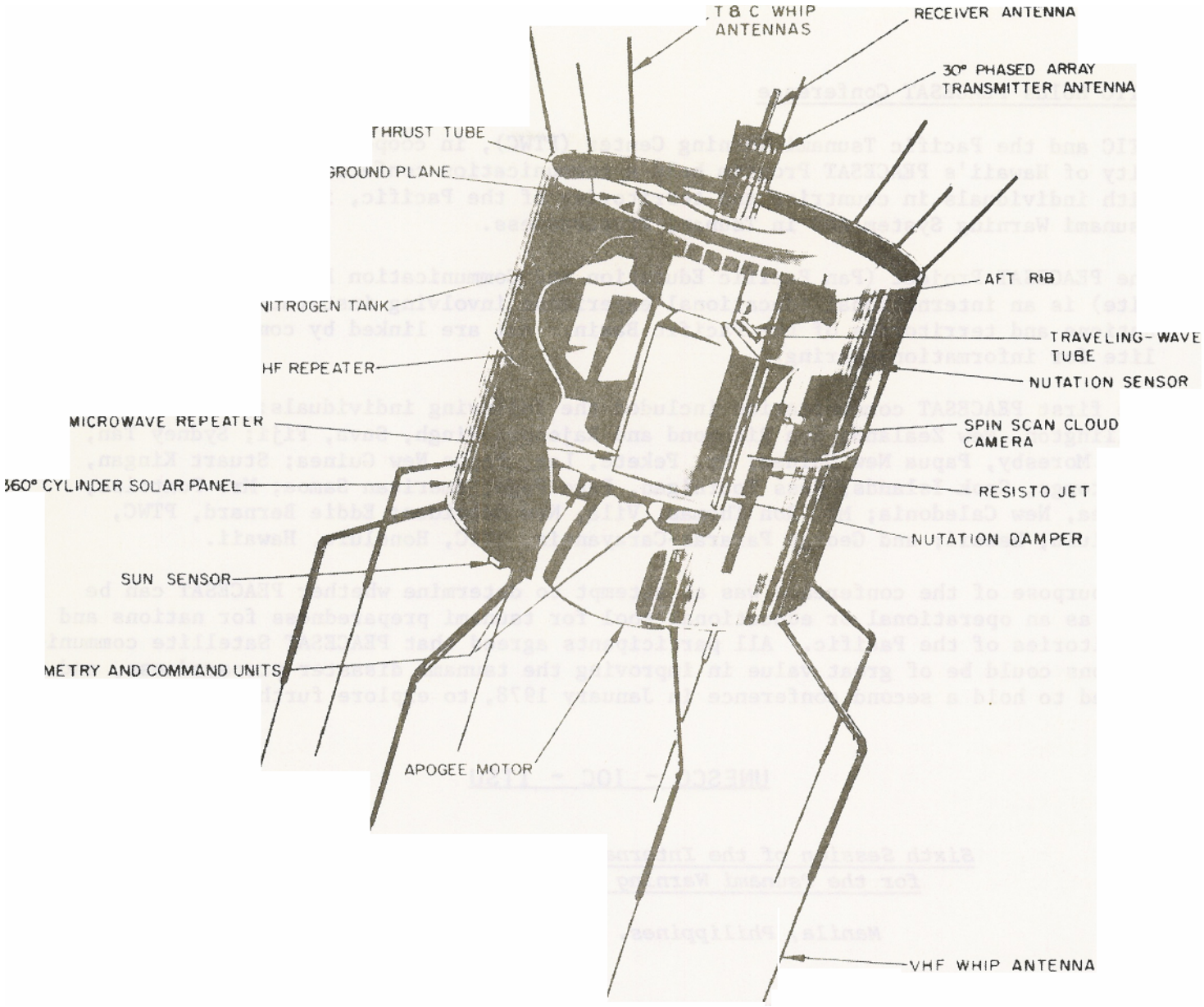
The purpose of the project is to experiment with the application of communications technology and new methods of operation especially designed for health, education and community services. Attention is focused on interaction among societies and requirements for social development. The project began in 1969 under the direction of Dr. John Bystrom, Professor of Communication at the University of Hawaii, and the experimental system has operated regularly since April 1971.

The PEACESAT system is a new arrangement of communications technology that is extremely flexible permitting conferencing among many locations over great distances. Needs are met and purposes served for which existing communication systems are not designed. The NASA ATS-1 satellite is the central relaypoint linking small ground terminals (Costing from U.S. $5,000 to U.S. $7,000) that are located as determined by the purposes and operations of the social services. The uniqueness of the project is in the networking over a very large geographical area among persons with different backgrounds. A variety of experimental networks are in operation today: Education, News, Medical, Science, Community Development, and Library.

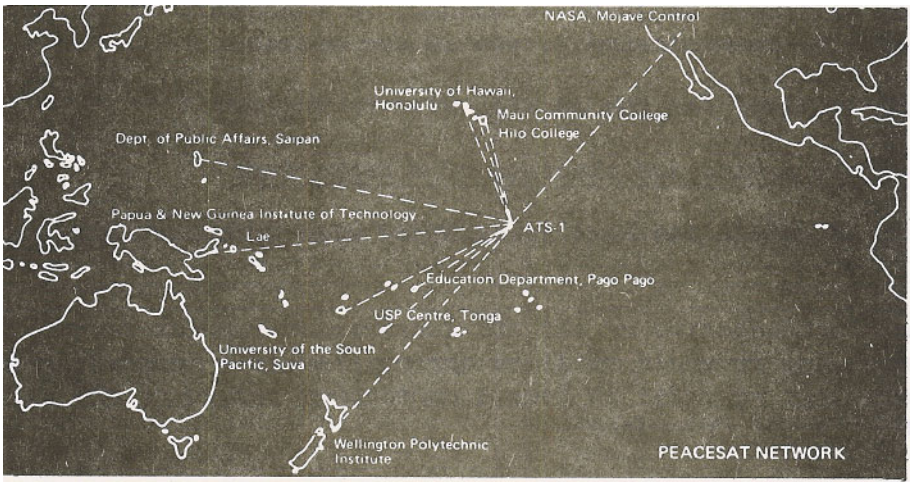
The satellite ground terminal, which can be set up quickly, is designed for two-way communication. When associated with related equipment, communication may be by voice, teletype, wired blackboard, computer, and still pictures. TV motion pictures are not included because of the extremely high costs involved and the project's emphasis on two-way communication from all locations.

The application of the satellite in this way to support social services has great potential internationally. It can provide immediate assistance to the developing areas of the world. At the same time, it can contribute world-wide to the advancement of science, the strengthening of culture, an increased flow of communication, and more effective education, health, and community services.

Participating nations and territories presently are: Wellington, New Zealand; Suva, Fiji; Nuku'alofa, Tonga; Lae and Port Moresby, Papua New Guinea; Saipan, Trust Territory of the Pacific Islands; Noumea, New Caledonia; Rarotonga, Cook Is.; Niue Is.; Honiara, Solomon Is.; Tarawa, Gilbert Is.; Vila, New Hebrides; Apia, Western Samoa; Santa Cruz, California; Honolulu, Hawaii; Pago Pago, American Samoa.



APPLICATIONS TECHNOLOGY SATELLITE **ATS 1**



THE PEACE SAT NETWORK, showing nine of the centres served by the satellite. Sixteen centres are now linked.

ITIC Holds PEACESAT Conference

ITIC and the Pacific Tsunami Warning Center (PTWC), in cooperation with the University of Hawaii's PEACESAT Program held a communication conference on 12 December with individuals in countries and territories of the Pacific, interested in the Tsunami Warning System and in Tsunami Preparedness.

The PEACESAT Project (Pan Pacific Education and Communication Experiments by Satellite) is an international educational experiment involving institutions in fourteen nations and territories of the Pacific Basin. All are linked by communication satellite for information sharing.

The first PEACESAT communication included the following individuals: Norman Ridgway, Wellington, New Zealand; Ron Richmond and Rajenora Singh, Suva, Fiji; Sydney Tan, Port Moresby, Papua New Guinea; Mr. Fekete, Lae, Papua New Guinea; Stuart Kingan, Rarotonga, Cook Islands; Russ Tournigan, Pago Pago, American Samoa; Mr. Pontoise, Noumea, New Caledonia; Mr. Ron Thomas, Vila, New Hebrides; Eddie Bernard, PTWC, Honolulu, Hawaii; and George Pararas-Carayannis, ITIC, Honolulu, Hawaii.

The purpose of the conference was an attempt to determine whether PEACESAT can be used as an operational or educational tool for tsunami preparedness for nations and territories of the Pacific. All participants agreed that PEACESAT Satellite communications could be of great value in improving the tsunami disaster preparedness, and agreed to hold a second conference in January 1978, to explore further its feasibility.

UNESCO - IOC - ITSU

Sixth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific

Manila, Philippines, 20-25 February 1978

ANNOTATED PROVISIONAL AGENDA

1. *Opening of the Session*

The Session will open at 10:00 on Monday, 20 February, in Manila. The exact meeting place will be communicated to you in due course.

The working language for the session will be English.

2. *Adoption of the agenda and election of a rapporteur*

This annotated agenda has been distributed with Circular Letter No. 670 dated 20 July 1977.

Whilst the representative of the IOC Secretariat remains responsible for the report of the meeting, it would still be appreciated if a rapporteur could be elected from the participants, in order to keep a continuous record of the discussion (Rule 25.3 of the IOC Rules of Procedure).

REVIEW

3. *State of implementation of resolutions EC-VII.13 and of recommendations 3 to 13, from the Fifth Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific (Lima, Peru, 23-27 February 1976).*

The Secretary will report on the state of implementation of

- *the 2nd operational paragraph of res. EC-VII.13, and of recommendations ITSU-V.5 and ITSU-V.6 on Trust Funds;*
- *the 3rd operational paragraph of res. EC-VII.13, and of recommendations ITSU-V.8 and ITSU-V.11, on UNEP supported projects;*
- *recommendation ITSU-V.10 on availability of geosynchronous satellites;*
- *recommendation ITSU-V.13 on educational material.*

The Director ITIC will report on the state of implementation of

- *the 5th operational paragraph of res. EC-VII.13 on the ICSU Guide to International Data Exchange;*
- *recommendation ITSU-V.9 on wave heights;*
- *recommendation ITSU-V.12 on training;*
- *recommendation ITSU-V.13 on educational material.*

Member States representatives are requested to report on their action taken in relation to resolutions and recommendations which are specifically addressed to them, such as:

- *the 2nd operational paragraph of resolution EC-VII.13 and recommendations ITSU-V.5 et ITSU-V.6 on Trust Funds;*
- *the lower part of the 5th operational paragraph of resolution EC-VII.13 on data provision;*
- *recommendation ITSU-V.7 on annual reports on tsunami research;*
- *recommendation ITSU-V.9 on expansion of tsunami dummy tests;*
- *recommendation ITSU-V.10 on the use of* GOES'.

4. *Decision of the IOC Assembly, at its 10th Session, on a new mandate for ITIC (Resolution X-...)*

The Secretary will report on the state of implementation of the 4th and 6th operational paragraph of res. EC-VII.13, and of rec. ITSU-V.1, and will introduce the new Assembly resolution.

The status of the Director ITIC and the Associate Director should be discussed under this item.

5. *Activity report by the Director, International Tsunami Information Center (ITIC)*

The Director, ITIC, will present a report on the activities of his Center over the last two years, other than those mentioned under item 3 of the agenda.

6. *National activity reports*

The representatives of Member States are invited to report on developments in their respective countries. Each speaker is requested to provide a short summary of his statement, in not more than 3 pages, in English, for distribution during the meeting.

7. *Consideration of recommendations from the IUGG Tsunami Committee meeting, held in Ensenada, Mexico, 23-26 March 1977*

The Chairman of the Committee is invited to introduce any recommendations relevant to ITSU activities.

NEW ACTIVITIES

8. *Proposals for further expansion of the Tsunami Warning System in the Pacific*

The Director, ITIC is invited to present plans for a further expansion of the Tsunami Warning System. The establishment of programme priorities, task teams for intersessional activities, and a discussion on cost/benefit should take place under this item. Member States are invited to formulate possible recommendations.

9. *Proposals for further technical improvement of the Tsunami Warning System in the Pacific*

The Director, ITIC is invited to present plans for further technical improvements in communication, standardization of information exchange, dummy tests, etc... Member States are invited to comment and to formulate possible recommendations.

The representative of the USSR is invited to give an evening lecture on quick warnings in case where the generation of a tsunami is very near the coast so that normal warning is too slow, with examples from the USSR.

10. *Proposals for research on tsunamis*

Member States, the Director, ITIC and the Chairman of the IUGG Tsunami Committee are invited to make proposals for research projects on tsunamis within the intergovernmental framework.

11. *Proposals for a tsunami educational programme*

The Director, ITIC will present elements for an educational programme. The representative of the USSR is invited to present the USSR tsunami film, with English sound track.

12. *Other matters*

Participants are invited to bring up other matters they may wish to have discussed, during item 2, when the agenda is adopted. It is suggested that a short background paper is presented on each additional item by the proposer.

13. *Date and Place of the Seventh Session of the International Co-ordination Group for the Tsunami Warning System in the Pacific*

Representatives of Member States are requested to consider inviting the Group for its next session, to be held in early 1980.

14. *Adoption of the Summary Report and recommendations*

The Secretary, with assistance of the Rapporteur, will provide a draft Summary Report, with recommendations, for approval (in English).

15. *Closure of the session*

The session is due to close at noon, on Friday, 25 February 1978.

TEMA Second Session

According to the September issue of the International Marine Science Newsletter, the IOC Working Committee for Training, Education and Mutual Assistance in the Marine Sciences (TEMA) held its second session at UN Headquarters in New York, 18-23 July 1977. The Committee set forth its program priorities for the next two years. The IMS Newsletter reports the following:

Many new concepts were brought forward during the discussions, marking a departure from the traditional approaches to training needs. One, which received enthusiastic support from delegates, was the proposal to hold a series of one-month workshops on the training of marine science technicians. These will take place during 1978-79 in each of several regions, based upon criteria proposed by member states according to their particular training needs.

In two recommendations, the committee endorsed assessments made of the training needs of developing member states, and encouraged greater activity by the international organizations and the nations involved at the regional level, both in the planning and participation phases. In all, 21 recommendations were made by the session, covering specific needs as well as matters relating to general policy. Highlights of some of these recommendations include:

Shipboard fellowships - recognized as being of great potential benefit, this program will be given more advance publicity than in the past so that a larger number of scientists can participate in the cruises;

Coastal zone management and marine pollution - due to the increased interest of coastal states in the problems of development and management of the coastal zone, related training courses are to be conducted in conjunction with the UN and relevant specialized Agencies;

Marine science administrators - a recommendation was made that IOC initiate a series of two-week workshops to be held in eight regions during the period 1978-81.

INTERNATIONAL TSUNAMI INFORMATION CENTER

Syd Wigen's Term Expires

Syd and Nancy Wigen departing Honolulu

Mr. Sydney Wigen ended his two-year term as Associate Director of the International Tsunami Information Center (ITIC) on the 30th of November and returned to the Institute of Ocean Sciences, of the Department of the Environment in Sidney, British Columbia, Canada. Mr. Wigen served as the first Associate Director for ITIC when the post was created in 1975 under an international agreement involving UNESCO- Intergovernmental Oceanographic Commission and member-states of the Pacific Tsunami Warning System. The Canadian Government most graciously supported this international post and are presently making a considerable contribution to the IOC-Trust Fund for partial support of this post.

During his tenure at ITIC, Mr. Wigen increased ITIC liaison with agencies and individuals concerned with seismic and tsunami observation, research, and warnings, assisted in the systematic collection of tsunami data, and begun a n1,;tmber of new initiatives, making ITIC a better service for the Pacific Community Nations interested in mitigating the catastrophic effects of tsunamis.

Organizational Change

Effective November 1, 1977, Dr. George Pararas-Carayannis became full-time Director of the International Tsunami Information Center (ITIC). ITIC is under the auspices of UNESCO-Intergovernmental Oceanographic Commission, and it is operated by the U.S. National Weather Service under an international agreement involving 15 Member States of the Pacific Tsunami Warning System. Dr. Pararas-Carayannis served in a dual capacity as Tsunami Specialist for the Pacific Region and as Director of ITIC for the last three years. Increased responsibilities mandated to ITIC and increased interest of member countries in participating more fully in Tsunami activities precipitated the need for the post of the Director of ITIC to become a full-time position. Dr. Pararas-Carayannis will continue to service as Tsunami Advisor for the State of Hawaii.

The ITIC is located on the University 0f Hawaii grounds at 2570 Dole Street, Honolulu, Hawaii 96822.

New Associate Director Appointed

With the approval and support of the New Zealand Government, Mr. Norman M. Ridgway, Physical Oceanographer at New Zealand Oceanographic Institute has been appointed by the Intergovernmental Oceanographic Commission to become the new Associate Director of ITIC.

Mr. Ridgway made a 6-week visit to ITIC in the summer of 1977, and became familiar in many of the activities of the Center. The new Associate Director is expected to arrive in Honolulu in January 1978 together with his wife Olwen and his daughter Jane.

EDITORIALS AND LETTERS

The following is an abstract of a letter written to Mr. Sydney Wigen, following the expiration of his term as Associate Director of ITIC:

Dear Sydney:

I want you to know that I greatly appreciate the support and assistance you provided in the administration of ITIC for the last 27 months and to express my own personal thanks for a job well done. Your presence and support here at ITIC over this period has been inspirational and helped us greatly in building a good program for ITIC and a good service for the Pacific Community Nations interested in the Tsunami Warning System, and tsunamis in general.

Some of the new initiatives you started here at ITIC were long needed, and thanks to you, these were organized and acted upon. By these actions, and your overall dedication and enthusiasm for our program, you made my job a great deal easier during this period, and you paved the way for your successor.

I am glad to hear that the Canadian Government plans to keep you working on tsunamis for at least a year, and I am looking forward to a continued and mutually beneficial association with you.

Sincerely,

George Pararas-Carayannis
Director, ITIC

NATIONAL AND AREA REPORTS

Director, Pacific Region-U.S. National Weather Service, Retires

Mr. Charles M. Woffinden, Director of the Pacific Region of the National Weather Service retired as of December 31st of this year, after serving almost four years in the Pacific Region and 40 plus years in the U.S. National Weather Service.

The Pacific Region of the National Weather Service is responsible for the operation of the Pacific Tsunami Warning Center (PTWC), and a number of U.S. tide gauge stations, as well as for logistical support of ITIC. During his tenure as Director of

the Pacific Region, Mr. Woffinden had overall responsibility for the U.S. National Tsunami Warning System.

Mr. Woffinden had a distinguished career with the U.S. Navy and the U.S. National Weather Service serving in a number of important management positions.

The staff of ITIC appreciates the support Mr. Woffinden has given ITIC over the last four years, and wishes him good luck in his retirement.

Pacific Region-US-NWS-Ocean Services Program Coordinator

As of 1 November 1977, LT. Dennis Sigrist (NOAA Corps), was assigned the responsibility of Ocean Services Program Coordinator for the Pacific Region of the U.S. National Weather Service. In this new role LT. Sigrist will be coordinating all marine programs of the Pacific Region including the Regional Tsunami Program. In this capacity, he will act also as the interface between field offices, Weather Service Headquarters, and other agencies.

LT. Sigrist has gained considerable experience in tsunami matters by serving as the Assistant Tsunami Specialist for the Region for the last three years, by coordinating the upgrading of the Regional Hawaiian Tsunami Warning System, and by assisting with many ITIC projects including the investigation of the Indonesian Tsunami of August 19, 1977.

Research Grant on Warnings

The Natural Hazards Observer of the Institute of Behavioral Science of the University of Colorado reports:

"The first year of a three year study of the "Dissemination of and Response to Natural Hazard Warnings" has just been funded ($260,750) by the U.S. National Science Foundation/Research Applied to National Needs Directorate. Principal investigators are Robert K. Leik, Minnesota Family Study Center, and John P. Clark and T. Michael Carter, Department of Sociology, University of Minnesota. There are three interrelated components of the study: dissemination and response in the network of community organizations, response and response diffusion among community households, and laboratory experiments on the factors influencing response. Field work is quasi-experimental in that communities will be studied prior to experiencing a disaster, with follow-up, post-disaster restudy for all communities subsequently struck. A total of 25 communities will be pre-studied, approximately evenly divided according to exposure to hurricane, flash flood and tornado, with a small parallel study of earthquake risk communities. Procedures for sufficient post-disaster data have been established if too few of the pre-studied sites are struck. Results of the study should shed light on the very practical problems of how to disseminate information about imminent hazards most effectively and how to generate appropriate responses to warnings. Information: John P. Clark, Natural Hazards Warning Systems, 2001 Riverside Ave., Minneapolis, MN 55454, (612) 376-1865."

ABSTRACTS AND RESUMES

Seismic Sea Waves -- Tsunamis

T. S. Murty
Fisheries and Environment
Ottawa, Canada

This Bulletin is an attempt to synthesize current knowledge of tsunamis. Although it is directed primarily to oceanographers, other disciplines are not excluded. The book deals with phase and amplitude dispersion problems and the "Ursell" parameter, which delineated various regimes of dispersion. The classical Cauchy-Poisson problem is also introduced and the subsequent developments in the field of water-wave generation due to explosions is discussed. Tsunami generation by earthquakes and seismic sources such as volcanic explosions and nuclear explosions is considered. Some related phenomena such as landslides and turbidity currents are also included. The propagation of tsunamis across the oceans is discussed. The influences of refraction, diffraction, and scattering is examined, and the problem of trapping tsunami energy by islands and shoals is examined in detail. The coastal tsunami problems such as forerunner, initial withdrawal of water, secondary undulations, and tsunami bore are included, as well as the influence of resonance on tsunamis. Tsunamis in various parts of the world are described. Tsunami warning systems of the past, present, and future are discussed, as well as tsunami instrumentation and protection measures. Background information on seismology is in the Appendix (in microfiche form).

Tsunami Risk Report Published in Chile

Professor Pablo Anguita Salas of the University of Chile, completed for the Chilean Navy's Hydrographic Institute an important study on the Assessment of the Tsunami Risk for the Northern Coast of Chile. This study was presented in the 2nd Chilean Seismic Engineering Congress, held in Chile in May 1976. The study has now been published as a report of the Hydrographic Institute.

Evaluacion de Riesgo de Tsunami Para la Costa Norte de Chile Entre Paralelos 18° y 24° S, Instituto Hidrografico de la Armada, I.H.A. Pub. 3014-A, Chile 1977.

Abstract: An analysis has been made of the probability of occurrence of earthquakes of magnitude 7.6 or greater with marine epicenter capable of generating a tsunami. From the historical data and the behavior of tsunami waves, dislocation areas were deduced and particular formulas were obtained to correlate the magnitude of the earthquake with the focal depth, tsunami magnitude, period and wave heights in the open sea.

Relation between Tsunami Inundation Heights and Water Surface Profiles on a 200 m Depth Contour

Isamu Aida
Earthquake Research Institute
University of Tokyo

Reliability of the tsunami source model inferred from the dislocation theory of

faulting was approximately verified previously, comparing the result of a numerical experiment with tsunami records at the coast. On the basis of above results, water surface profiles on a 200 m depth contour have been computed numerically by use of the tsunami source model obtained from the fault parameters of the Tokachi-oki earthquakes of 1968 and 1952. Computed water elevation-time histories indicate the significant character for the directivity of the wave radiation from the source, that is the sense of rise or fall in the leading wave and the wave period. The wave heights (H_0), of course, vary depending on locations on a 200 m depth contour. Tsunami inundation heights (R) at a coast and H_0 are plotted along the Pacific coast of the Tohoku and Hokkaido districts. Then, average inundation heights (R_{avg}), which are used instead of R rather scattered, are fairly well parrallel to H_0 and $R_{avg}/H_0 = 2 \sim 3$. It is recognized by a simple calculation that the values of R_{avg}/H_0 are reasonable as the amplification factor of water oscillations on a continental shelf. Therefore, the tsunami source model based on the dislocation theory of faulting seems to give results fairly consistent with the major character of tsunami, at least, in the Pacific coast of Tohoku district. Thus, the kind of a numerical experiment may be a useful method for a prediction of tsunami inundation at the coast of interest.

ANNOUNCEMENTS

COASTAL ZONE '78 - March 14-16, 1978

COASTAL ZONE '78, a national symposium on the technical, environmental, socio-economic and regulatory aspects of coastal zone planning and management, will be held March 14, 15 and 16, 1978 at the Jack Tar Hotel in San Francisco, California.

COASTAL ZONE '78 will be a multidisciplinary specialty conference to provide an opportunity for those scientists, engineers, planners, and other involved professionals to convene and exchange information and views. The purpose of the conference is to provide a forum for discussion of coastal zone management, beneficial use, protection and development leading hopefully to a better understanding of the interrelationships between the environmental, socio-economic, engineering, and regulatory decisions involved. The conference will foster more effective and meaningful jurisdiction arrangements, conservation considerations, regulations, enforcement policies, planning activities, and design parameters in the development and implementation of coastal plans.

The conference, which is expected to attract more than 1,000 participants, is sponsored by the American Society of Civil Engineers, in cooperation with The Conservation Foundation and the U.S. Office of Coastal Zone Management. In addition, the U.S. National Ocean Survey, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the U.S. Bureau of Land Management, the U.S. Geological Survey, the U.S. Environmental Protection Agency and various California state agencies are serving as co-sponsors.

More than 200 papers will be presented during the three day event covering themes of "Planning and Management Considerations," "Environmental Considerations," and "Engineering and Other Technical Considerations." The conference will be preceded by a one-day short course on the History and Implementation of Coastal Zone Management. All papers will be printed in the Proceedings made available to symposium participants.

Further information and a preliminary program, including a listing of paper titles and authors, is available by writing to: Mr. J. Robert Edmisten, Executive Director, COASTAL ZONE '78, P.O. Box 26062, San Francisco, California 94126, U.S.A.

Pacific Science Association - Third Inter-Congress

General. The Third Inter-Congress of the Pacific Science Association was held at Bali, Indonesia, July 18 to 22, 1977, under the sponsorship of the Indonesian Institute of Sciences (LIPI). Chairman of the Organizing Committee was Prof. Dr. H. Tb. Bachtiar Rifai, Chairman of LIPI. The meeting was declared open by His Excellency the President of the Republic of Indonesia and participants in the Opening Ceremony were also addressed by the Honourable Governor of Bali.

Theme of the program was "Appropriate Technology," and the keynote address on the theme was given by Prof. Sumitro Djojohadikusumo, Minister of State for Research of the Republic of Indonesia. Sub-themes were (1) The Role of Various Stages of Technology Relevant to Developing Countries, led off by Dr. Hyung Sup Choi, Minister for Science and Technology, Republic of Korea; (2) Appropriate Technology in Action, Dr. E. F. Schumacher (deceased September 4, 1977; formerly of London); (3) Generation and Diffusion of Relevant Technology, Ir. Ben van Bronckhorst, University of Technology, Eindhoven, Netherlands; (4) Management of Resources and Technology for Development, Dr. Lester Brown, Worldwatch Institute, Washington, D.C., U.S.A.; and (5) International Cooperation on Problems of Appropriate Technology, Dr. Jerry C. L. Chang, East-West Center, Honolulu, Hawaii, U.S.A. A number of selected contributed papers were included in the program.

Twelfth International Symposium on Mathematical Geophysics - Preliminary Announcement

The IUGG Inter Association Committee on Mathematical Geophysics is sponsoring the twelfth symposium in a series of international symposia devoted to mathematical geophysics, to be held at Caracas, Venezuela in August 14-24, 1978.

The purpose of the Symposium is the discussion of studies on aspects of mathematical geophysics. It will include the following main topics:

1. Automatic Processing of Large Amounts of Data

   including problems of exploration of earth resources, data reduction in the field of prediction of natural catastrophes, and pattern recognition.

2. Inverse Problems of Geophysics

   including problems of lateral heterogeneity and solutions to difficult foward problems.

3. Models of Evolution of the Earth's Solid, Liquid and Atmospheric Regions

   including tectonic evolution, origin of the oceans and atmospheres and long term climatology.

4. Mathematical and Computational Problems in Prediction of and Risk due to Natural Catastrophes

   including problems of prediction of Earthquakes, Tornadoes, Typhoons, etc.

All communications concerning the Symposium should be addressed to:

FUNVISIS
Apartado Postal 1892
Caracas 101
Venezuela

The Symposium will be organized by the Venezuelan Foundation for Seismic Research (FUNVISIS). All scientists interested in attending are requested to get in touch with the organizers.

International Symposium on Long Waves in the Ocean - June 6-8, 1978

The Department of Fisheries and the Environment, Canada under the sponsorship of the International Union of Geodesy and Geophysics; the American Meteorological Society; the National Research Council, Canada; and the Canadian Meteorological and Oceanographic Society, will hold an International Symposium on Long Waves in the Ocean, on June 6-8, 1978 at the National Research Council; Sussex Drive; Ottawa, Canada. Program sessions will be held on Tidal Theory, Tidal Observation and Analysis, Tsunami, Storm Surge, Continental Shelf Waves, and Instrumentation.

Abstracts are due by March 1, 1978 and are to be distributed to participants before the meeting. Summaries of presented papers will be published, probably as a Manuscript Report. Contributions to this report should be no more than four pages and should be submitted by July 1, 1978.

The Program, with a list of papers to be presented in each section as well as advice concerning available accommodation, will be mailed by the end of March. If interested to attend, write to:

Organizing Committee
Long Wave Symposium
Marine Environmental Data Service
Department of Fisheries and Environment
Canada K1A OE6

International Geodynamics Conference - 13-17 March 1978: I-Geodynamics of the Western Pacific - Indonesian Region; II - Physics and Chemistry of Magma Genesis, Tokyo, Japan.

Sponsors: Science Council of Japan, IUGS Commission on Experimental Petrology, and the International Associations of Seismology and Physics of Earth's Interior (IASPEI), Volcanology and Chemistry of Earth's Interior (IAVCEI), and Physical Science of Ocean (IAPSO). Contact: K. Kobayashi, Ocean Research Institute, 1-15-1. Minami-dai, Nakano-ku, Tokyo 164, Japan.

Oceanology International 78, 5-10 March, Brighton, Shoreham and Newhaven.

Conference Secretary, OI 78, BPS Exhibitions Ltd., 4 Seaford Count, 220-222 Great Portland Street, London W1N 5 HH, United Kingdom.

14th Pacific Science Congress - August 1979

The 14th Pacific Science Congress will be held in Khabarovsk, USSR, in the latter part of August, 1979.

President of the Congress is Academician A. V. Sidorenko, Vice-President of the USSR Academy of Sciences, who is also Chairman of the Organizing Committee. General Secretary of the Organizing Committee is Dr. A. A. Aksenov. Deputy General Secretary is Dr. K. V. Malakhovsky.

International Workshop on Ocean Instrumentation

Sponsored by the Engineering Committee on Oceanic Resources (ECOR), the workshop will be held at the National Academy of Sciences, Washington, D.C., 1-3 May 1978.

Background papers are being solicited on six basic themes, including: environmental factors; structural integrity; environmental impact; site and location evaluation and operational monitoring; reclamation or preservation of site; and ocean floor geotechnical properties.

Proposals for submission of papers should be accompanied by a brief biographical sketch of the candidates and a resume of the text. Persons interested in submitting a paper or attending the workshop should contact, no later than 31 October 1977:

Jack W. Boller, Secretary
U.S. National Committee/ECOR
2101 Constitution Avenue N.W.
Washington, D.C. 20418, USA

IUGG Tsunami Publications

The International Union of Geodesy and Geophysics (IUGG) Publications Office has informed ITIC of the availability of two volumes which relate to tsunamis, namely

1. Proceedings of the Tsunami Meetings, Honolulu, 1961 (256 pages)
   U.S. $7.20/copy

2. Annotated Bibliography on Tsunamis, 1964 (249 pages)
   U.S. $6.20/copy

Both of these publications are of great scientific value and copies can be purchased by writing to:

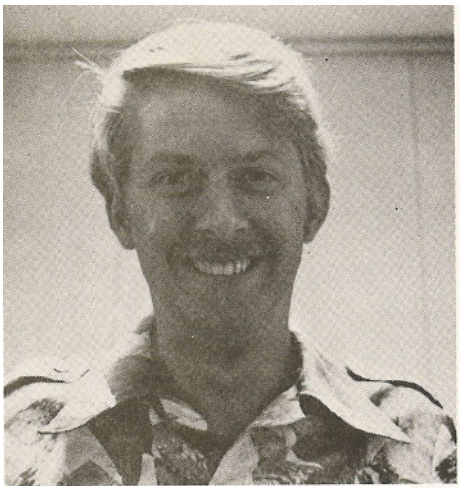
Mr. G. Laclavere
Director, IUGG Publications Office
39 TER, Rue Gay-Lussac
75005 Paris, France

Seismic Summary (September 4 to Press Time)

The Pacific Tsunami Warning Center undertook the following investigations of large earthquakes during this period:

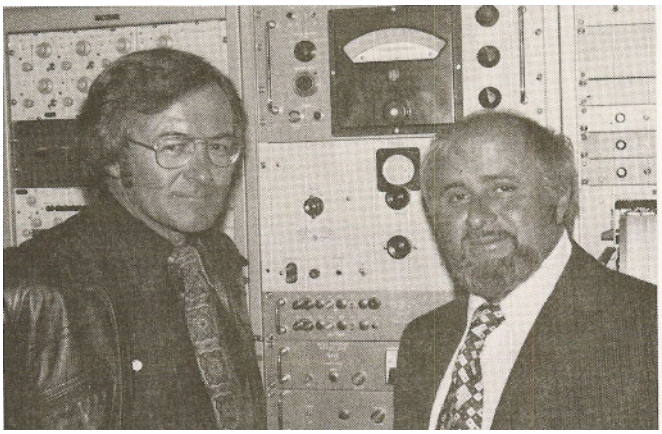
Event No.	Event	Location	Action Taken
1977-16	Oct 10 1154 6.9	Tonga Area 26.1 S 175.3 W	Press Release Issued
1977-17	Oct 17 1726 6.5	New Zealand 29.3 S 173.0 E	"
1977-18	Nov 4 0952 6.9 (6.5 Palmer)	Adak, Alaska 51.7 N 175.8 W	"
1977-19	Nov 23 0926 7.3	Region north of Santiago, Chile 31.1 S 67.3 W	"
1977-20	Dec 21 0101 6.9	Bonin Islands, Japan 25.6 N 143.0 E	"

General Valentine A. Siefermann, Director of Hawaii Civil Defense; Dr. George Pararas-Carayannis, Director, ITIC; and Mr. Robert Schank, of Hawaii Civil Defense, during a recent Tsunami Luncheon Meeting.

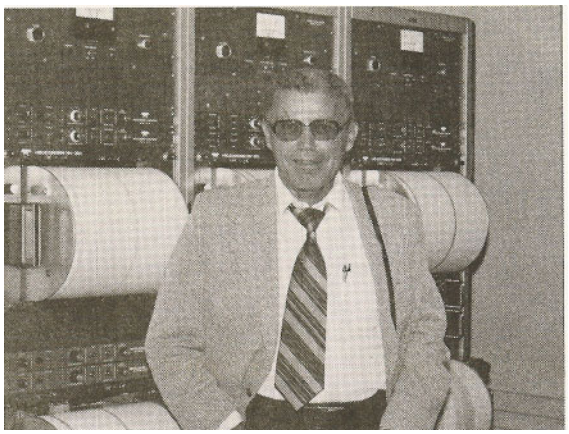


Lt. Dennis Sigrist, new Ocean Services Program Coordinator for the Pacific Region, NWS

Participants of the Tsunami Wrng System Coordinating Mtg in Alaska last September. L to R: Phil Williams, Jr., Western Region, NWS; Dr. Eddie Bernard, GIG, Pacific Tsunami Wrng Center; Stuart Bigler, Director, Alaskan Region, NWS; Charles Woffinden, Director, Pacific Region, NWS; Dr. Harold Loomis, Tsunami prgm Leader, Environmental Rsch Labs; Dr. Glenn Flittner, Chief, Ocean Svcs Div, NWS; Bert Thompson, U.S. ITSU Contact; and Karl Johannessen, Associate Director, NWS.



Bertrand Thompson, U.S. National Contact for ITSU, and George Pararas-Carayannis, during a recent meeting at the Palmer Observatory of the Alaska Reg~ona1 Tsunami Warning System.



Charles Woffinden, who recently retired from his post as Director of the National Weather Service Pacific Region.

THE STAFF OF

THE INTERNATIONAL TSUNAMI INFORMATION CENTER

WISHES ALL

A HAPPY NEW YEAR!!